



Bangladesh University of Engineering & Technology

Department of Physics

Course Code: PHY 115 (ARCH)

Teacher's name: Mehnaz Sharmin

Course Objectives:

Sound is a form of energy which is an essential part of our everyday life. It is produced when something vibrates and in turn causes the medium (water, air, etc.) around it to vibrate. Human emotion, biological movement, social interactions, comfort of living, etc. are strongly dependent on the sound around us. Sometimes sound gives us happiness (Example: bird's chirping, flow of fountains, melodious music, etc.), sometimes it is a noise or pollution (Example: loudspeakers, heavy machine sounds, vehicle horns, etc.). Sometimes sound can irritate people even inside an apartment or auditorium or classrooms or any other buildings if proper acoustics are not obeyed while designing the structure. So, the knowledge of sound is very important in architecture. The objective of this course is to clarify the basic knowledge of generation of sound by oscillations and various characteristics of sound waves and to present some real-life examples of the applications of this subject.

Lecture Plan for Sound:

Lectures	Topics
1-5	Simple harmonic motion: Differential equation of simple harmonic oscillation, Energy of simple harmonic oscillator, Damped oscillation. Forced oscillation.
6-10	Characteristics of mechanical waves, Equations of a travelling wave, Energy; Stationary waves: Beats, Physical qualities of sound, Reflection, Transmission and intensity of sound waves.
11-14	Variation of sound intensity with distance, Units of sound intensity: Decibel and other units, Doppler's principle.

References:

1. Physics for Engineers (Part-1) - Dr. Gias Uddin Ahmad
2. Waves and Oscillation – Brij Lal and N. Subramaniam
3. A Text Book of Waves and Oscillations - Ashok K. Ganguly

Learning Outcomes:

After finishing this course a student will be able to-

1. Understand the nature of different types of oscillations, establish and solve the equation of motion for a system undergoing those types of oscillations.
2. Calculate the energy of an oscillator.
3. Distinguish different types of waves and the phenomena related to them.
4. Detailed knowledge on sound waves
5. Explain Reverberation in terms of Sabine's formula.